

THEREFORE, WE CLAIM:

1. A gas sensor, comprising:  
a housing including a cavity, the housing including an anode within the cavity;  
and  
a controller in communication with the anode and configured to measure sensor current output.
2. The gas sensor of claim 1, wherein the controller is further configured to determine the remaining life of the sensor.
3. The gas sensor of claim 1, wherein the controller is configured to subtract a cumulative current output of the sensor from a theoretical total to determine the remaining life of the sensor.
4. The sensor of claim 1, wherein the controller is configured to communicate the sensor current output in encrypted format.
5. The sensor of claim 1, wherein the controller is further configured to communicate sensor data output selected from the group consisting of date of manufacture, serial number, diagnostic information, and exposure history information of the gas sensor.

6. The gas sensor of claim 1, wherein the controller is a microcontroller positioned within the housing of the sensor.
7. The gas sensor of claim 1, further comprising an analog to digital converter in communication with the controller.
8. The gas sensor of claim 7, further comprising a display in communication with the analog to digital converter and configured to display the remaining life of the sensor.
9. The sensor of claim 8, wherein the display is selected from the group consisting of a light-emitting diode display, light-emitting diode pixel display, liquid crystal display, raster display, neon digit display, and electronic ink.
10. The sensor of claim 1, wherein the controller is coupled to a host system.
11. The sensor of claim 10, wherein the host system is configured to display the remaining life of the sensor.
12. A gas sensor, comprising:
  - a housing including a cavity, the housing including an anode within the cavity;
  - a controller in communication with the anode and configured to measure sensor current output and determine the remaining life of the sensor;
  - an analog to digital converter in communication with the controller; and

a display in communication with the analog to digital converter and configured to display the remaining life of the sensor.

13. The gas sensor of claim 12, wherein the controller is configured to subtract a cumulative current output of the sensor from a theoretical total to determine the remaining life of the sensor.

14. The sensor of claim 12, wherein the controller is configured to communicate the sensor current output in encrypted format.

15. The sensor of claim 14, wherein the controller is further configured to communicate sensor data output selected from the group consisting of date of manufacture, serial number, diagnostic information, and exposure history information of the gas sensor.

16. The gas sensor of claim 12, wherein the controller is a microcontroller positioned within the housing of the sensor.

17. The sensor of claim 12, wherein the display is selected from the group consisting of a light-emitting diode display, light-emitting diode pixel display, liquid crystal display, raster display, neon digit display, and electronic ink.

18. The sensor of claim 12, wherein the controller is coupled to a host system.

19. The sensor of claim 18, wherein the host system is configured to display the remaining life of the sensor.

20. A gas sensor, comprising:

a housing including a cavity, the housing including an anode within the cavity;  
and

means for measuring sensor current output at the anode and determining the remaining life of the sensor.

21. A system for determining the remaining life of a gas sensor, comprising:

a housing including a cavity, the housing including an anode within the cavity;  
a controller in communication with the anode and configured to measure sensor current output; and

a host system in communication with the controller and configured to receive data output from the controller.

22. The system of claim 21, wherein the controller is further configured to determine the remaining life of the sensor, at least one of the sensor and the host system is configured to display the remaining life of the sensor.

23. The gas sensor of claim 21, wherein the controller is configured to subtract a cumulative current output of the sensor from a theoretical total to determine the remaining life of the sensor.
24. The sensor of claim 21, wherein the controller is configured to communicate the sensor current output in encrypted format.
25. The sensor of claim 21, wherein the controller is further configured to communicate sensor data output selected from the group consisting of date of manufacture, serial number, diagnostic information, and exposure history information of the gas sensor.
26. The gas sensor of claim 21, wherein the controller is a microcontroller positioned within the housing of the sensor.
27. The sensor of claim 21, wherein the display is selected from the group consisting of a light-emitting diode display, light-emitting diode pixel display, liquid crystal display, raster display, neon digit display, and electronic ink.
28. A method of determining the remaining life of a gas sensor, comprising:  
measuring sensor current output by a controller;  
subtracting a cumulative current output of the sensor from a theoretical total to determine the remaining life of the sensor.

29. The method of claim 28, further comprising communicating the sensor current output in encrypted format.

30. The method of claim 28, further comprising communicating at least one of remaining life, date of manufacture, serial number, diagnostic information, and exposure history information of the gas sensor.

31. The method of claim 30, further comprising displaying at least one of remaining life, date of manufacture, serial number, diagnostic information, and exposure history information of the gas sensor.